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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,700	03/23/2006	Eric Fassiau	05129-00116-US	2343
23416 7590 12/01/2008 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899			EXAMINER TISCHLER, FRANCES	
			ART UNIT	PAPER NUMBER
			1796	
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			12/01/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/564,700	<b>Applicant(s)</b> FASSIAU ET AL.	
	<b>Examiner</b> FRANCES TISCHLER	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11-16 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-16 and 18-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/16/08</u> .   | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

The 112 rejection and double patenting rejection not addressed below are deemed withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11, 12, 16 and 19 – 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Vandenhende et al (US 2003/0119925).

The rejection stands as per reasons of record as stated in the previous office action of 6/25/08:

Regarding claims 11 and 22: Applicant claims a process for recovering a polymer in solution in a solvent by precipitating it with a non-solvent introduced gradually into the solution which causes a phase separation and then a phase inversion, the amount of which is initially less than required for phase inversion and is subsequently introduced at least partly in vapor form. The amount Q' is introduced into the precipitation medium, then the rest of the non-solvent is introduced predominantly in vapor form. Similarly, Vandenhende discloses (abstract, [0025], [0038], claims 1 and 2) the process of recycling a plastic dissolved in a solvent and precipitated out with a non-solvent. Vandenhende discloses ([0026], claim 3) the gradual addition of the non-solvent where a phase inversion is generally observed, that is to say the precipitation medium changes from a dispersion of the non-solvent in the solvent to a dispersion of the solvent in the non-solvent. A gradual addition of the non-solvent will necessarily cause a phase separation claimed by applicant and, as the addition of non-solvent continues, it will lead to a phase inversion claimed by applicant. At some point in time the non-solvent will hit the quantity Q' and the quantity Q required for phase inversion, which

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reads on applicant's Q and Q' quantities. Vandenhende also discloses ([0024], [0041]) injecting the non-solvent in both liquid and gaseous form for a faster precipitation, and the injection of steam to permit for easier solvent removal (through azeotropic distillation), which reads on applicant's claim of introducing the non-solvent into the precipitation medium at least partly in vapor form or predominantly in vapor form.

Regarding claims 12 and 23: Vandenhende discloses ([0014], [0018], [0032], [0038], claim 10) PVC as the polymer to be recycled, MEK as the solvent and water as the non-solvent, corresponding to applicant's claim of PVC, MEK and water.

Regarding claim 16: Applicant claims that the solvent and non-solvent form an azeotrope and the quantity of non-solvent in vapor form allows for the azeotropic distillation of the solvent. Vandenhende discloses ([0034]) the use of a solvent and non-solvent to form an azeotropic mixture so that the solvent can be removed by evaporation of the precipitation medium in the form of vapor of azeotropic composition, corresponding to applicant's claim.

Regarding claim 19: Based on the assumption that applicant meant to treat claim 19 as dependent on claim 11 and not on cancelled claim 1: Applicant claims a process for recycling an article based on at least one polymer which comprises optionally shredding the article into fragments with an average size of 1 to 50 cm, contacting the article fragments with a solvent able to dissolve the polymer and recovering the polymer using the process of claim 1 (where Examiner assumes Applicant meant claim 11). Similarly, Vandenhende discloses (abstract, [005] - [007], [0025], claims 1, 2 and 12) a process of recycling a plastic where an article is shredded into fragments having an average dimension of 1 – 50 cm, contacting the fragments with a solvent capable of dissolving the polymer and recovering the polymer from solution as discussed.

Regarding claim 20: Applicant claims the process of recycling which is a closed loop process in which the solvent and non-solvent are regenerated in part by decantation and wherein a phase separation agent is present at least in part during said decantation but substantially absent during precipitation of the polymer. Similarly, Vandenhende discloses ([0035], [0036], example 1) the process of recycling which operates in a closed loop where the solvent, non-solvent and phase separating agent are condensed, subjected to a settlement process and non-solvent removed prior to reuse for dissolution of the plastic. Vandenhende discloses (paragraph 0047 in example 1) adding hexane (the phase separating agent) after the vapor was recovered, then stirring and decanting, reading on applicant's claim of decanting in the presence of a phase separating agent. Since the phase separating agent was introduced during the recovery of the vapor, it was necessarily absent during the polymerization of the polymer, reading on applicant's claim that the phase separation agent is absent during the precipitation of the polymer.

Regarding claim 21: Applicant claims the phase separation agent with a greater affinity for the solvent than the non-solvent and is substantially removed from the solvent before the polymer is dissolved. Vandenhende discloses (example 1) adding hexane as the phase separating agent, which has a greater affinity for MEK than water, corresponding to applicant's claim of a phase separation agent with a greater affinity to

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the solvent. Since the hexane is introduced after the vapor was recovered, the hexane was not there before the polymer was dissolved, corresponding to applicant's claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 13 – 15, 18, 24 - 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vandenhende et al (US 2003/0119925).

The rejection stands as per reasons of record as stated in the previous office action of 6/25/08:

The disclosure of Vandenhende is adequately set forth in the paragraphs above and is incorporated herein by reference.

Regarding claims 13 – 15 and 24 - 26: Applicant claims Q' and Q quantities of non-solvent being introduced before and after phase inversion, time duration of said introductions, and introduction of non-solvent in vapor form. Vandenhende fails to teach Q' and Q values and the time period for addition of the non-solvent. However,

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Vandehende's disclosure ([0026]) of the gradual addition of non-solvent means that at a point in time the non-solvent will hit a Q' value and at another point in time it will hit the Q value. Vandehende also discloses ([0024], [0041]) the gradual addition of non-solvent in both liquid and gaseous form and did not specify that it need to be done at a specific point. It is prima facie obvious to introduce the vapor at some point in time during the gradual introduction of the non-solvent that may hit the desired point claimed by applicant. It is noted that Q and Q' depend on the nature of solvent, non-solvent and polymer to be precipitated. The case law has held that "A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to achieve the claimed Q' and Q values through routine optimization and thereby obtaining the invention.

Regarding claim 18: Applicant claims a precipitating medium comprising two different dispersants of which one has greater affinity for the non-solvent and the other has a greater affinity to the solvent. Vandehende teaches a dispersant but fails to teach two different dispersants. However, Vandehende discloses ([0025]) the use of various dispersing agents, including polyvinyl alcohol, bentonite, gelatin, esters or ethers of cellulose, water-soluble (co)polymers, etc. The case law has held that "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). It would have been obvious to one of ordinary skill in the art in the instant case to have used any two dispersants in combination such that one has a greater affinity to the solvent and the other has a greater affinity to the non-solvent.

Claim 18 is further rejected under 35 U.S.C. 103(a) as being unpatentable over Vandehende et al (US 2003/0119925) in view of Rosano (US 4,146,499).

The disclosure of Vandehende is adequately set forth in the paragraphs above and is incorporated herein by reference.

Vandehende's use of one or more dispersants is discussed above. Alternatively, the use of dispersants is discussed in view of Rosano:

Rosano discloses (abstract) the use of two surfactants in the preparation of oil-in-water microemulsions where the first surfactant is dissolved in the oil, both then added to the water phase and, subsequently, the second surfactant (which is more soluble in water than the first) is then added. Rosano discloses (column 4, lines 59 – 62 and column 5, lines 28 – 40) that this process of using two surfactants in a hydrophobic/hydrophilic moiety is advantageous in chemical reactions involving

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hydrophobic substances such as polymers (column 5, lines 28 - 40). This process has the advantage of providing a convenient means of preparing microdispersions of such substances in water to facilitate chemical reactions and other such uses of such substances.

In light of such benefit, it would have been obvious to one of ordinary skill in the art to utilize a combination of surfactants as taught by Rosano in the disclosure of Vandenhende.

### ***Response to Arguments***

Applicant's arguments filed 9/25/08 have been fully considered but they are not persuasive.

Applicant submits that, in the instant claim, liquid water is first added followed by water vapor with the advantage over Vandenhende in that the vapor is used only when required, therefore causing less energy consumption. Vandenhende discloses ([0024], [0041]) injecting the non-solvent in both liquid and gaseous form for a faster precipitation, and the injection of steam to permit for easier solvent removal (through azeotropic distillation), which reads on Applicant's claim of introducing the non-solvent into the precipitation medium at least partly in vapor form or predominantly in vapor form. The language used by Applicant of "partly" and "predominantly" reads on any amount and Vandenhende discloses the use either or both liquid and vapor water in any order or percentage, reading on Applicant's claim, since the amount of water can be predominantly vapor or predominantly liquid or any mixed percentage and applied in any order, given the language used by Vandenhende. Vandenhende recognizes the use of both liquid and gaseous forms of water because it causes faster precipitation and

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easier solvent removal. The fact that Applicant believes in adding liquid followed by liquid with predominantly vapor for economic reasons does not carry patentable weight. It has been held that: The fact that a combination would not be made by businessmen for economic reasons does not mean that a person of ordinary skill in the art would not make the combination because of some technological incompatibility. In re Farrenkopf, 713 F.2d 714,219 USPQ 1 (Fed. Cir. 1983): MPEP 2144 VII.

Applicant submits that the amount of non-solvent and the time required to add it is not determined by routine experimentation. Vandenhende discloses to gradually add the non-solvent and that a phase inversion is noticed during said process ([0026]). It would have been obvious to one of ordinary skill in the art to have measured how much non-solvent is being added to cause a phase inversion and to cause precipitation of the polymer, and it would have been obvious to one of ordinary skill in the art to have timed these events.

Applicant submits that Vandenhende does not identify a phase inversion as a critical phenomenon at which point vapor must be used. However, Vandenhende does recognize phase inversion, specifically as an observed phenomenon ([0026]), which is seen during the gradual addition of the non-solvent which can be in either liquid or vapor form or both in any percentage.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Frances Tischler whose telephone number is (571)270-5458. The examiner can normally be reached on Monday-Friday 7:30AM - 5:00 PM; off every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jim Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Irina S. Zemel/  
Primary Examiner, Art Unit 1796

Frances Tischler  
Examiner  
Art Unit 1796

/FT/